

Bidding and Administration

Contract bidding and administration immediately followed design completion for each of the 10 pilot projects. This chapter provides an overview of the qualification requirements for project bidders, the time required to bid and award projects, level of interest and competition from bidders, issues encountered and resolved during bidding, and final contract prices for each pilot project. Two of the pilot projects, Ronald and Skyway, were issued for bid by the respective sewer agency.

6.1 Contractor Qualifications

Sewer rehabilitation using trenchless technologies is a relatively new industry. Many new products are available, and manufacturers and product installers are beginning new ventures within the field. Because the technology is new, it was important to ensure that contractors had suitable experience and personnel trained to perform the work. Selecting experienced contractors ensured that products and technologies used in the pilot projects accurately represented I/I reduction capability.

To ensure sufficient experience, the three lowest bidders were required to submit their qualifications. Technical specifications for each primary rehabilitation technology included minimum qualification requirements for the product manufacturer, product installer, and the field superintendent charged with day-to-day responsibility for field crews. Requirements focused on: (a) years of experience, (b) minimum installed quantity of material for each rehabilitation method, and (c) experience of the field superintendent.

Pilot projects included variety in the type of rehabilitation work to be performed. Thus, it was difficult for a single general contractor to qualify for performing all the work. General contractors typically needed to team with one or more subcontractors when submitting bids in order to satisfy the qualification requirements. For example, on pilot projects utilizing cured-in-place pipe (CIPP), general contractors typically met requirements for installing CIPP in sewer mains. However, to meet the qualification requirements for lining service connections, the general contractor needed to team with a specialty subcontractor to perform this portion of the work.

While it was important that highly competent personnel perform rehabilitation work, it was necessary at the same time to avoid limiting competition by imposing overly strict requirements. Limiting competition would translate into higher bid prices. Careful consideration was given to crafting realistic qualification requirements during the project design. After the requirements for a rehabilitation technology were established, various contractors and product manufacturers were contacted to ensure that a sufficient number qualified.

The following sections summarize the qualifications required for each major rehabilitation technology used in the pilot projects.

6.1.1 Cured-In-Place Pipe

CIPP qualification requirements for sewer mains, laterals, and side sewers were included on the Brier, Kent, Lake Forest Park, Mercer Island, and Redmond pilot projects. The requirements focused on qualifications of the product manufacturer, installer, and field personnel:

- Both the manufacturer and installer were required to have supplied a minimum of 50,000 linear feet of CIPP installations. In some cases the manufacturer and installer were separate entities. In other cases the manufacture and installer were the same company.
- The field superintendent was required to have supervised a minimum of 20,000 linear feet of CIPP installations.
- The general contractor was required to have a minimum of 5 years of experience in sewer rehabilitation projects and familiarity with CIPP processes.
- The lateral cutter (the field person responsible for reinstating the connection between the sewer main and lateral after lining) was required to have at least 6 months of experience. This qualification was required because a poor job of reinstating the connection is one of the most common ways that new CIPP is damaged.
- The liner installer was required to be licensed by the manufacturer to perform CIPP installation.

6.1.2 Service Connection Liners

Service connection liners (SCLs), one of the newer rehabilitation technologies explored by the pilot projects, were utilized where sewer mains were being lined. Qualification requirements included on the Brier, Kent, Lake Forest Park, Mercer Island, and Redmond pilot projects were as follows:

- The manufacturer was required to have supplied a minimum of 200 one-piece liner installations.
- The installer was required to have installed a minimum of 200 one-piece liner installations.
- The field superintendent was required to have supervised a minimum of 200 one-piece liner installations.
- The contractor was required to have a minimum of 5 years of experience in sewer rehabilitation projects and familiarity with CIPP processes.
- The installer was required to be licensed by the manufacturer to perform SCL installations.

- A schedule showing the estimated timing of the SCL installation work was required during the qualification review. The schedule was required due to the County's concern that if only one subcontractor was responsible for a majority of the SCL work, then the overall completion schedule for the pilot projects could not be met.

6.1.3 Manhole Linings and Coatings

Manhole rehabilitation using coatings and linings was performed on the Brier and Lake Forest Park pilot projects. The requirements focused on qualifications of the liner/coating manufacturer and the coating system applicator:

- The contractor was required to provide certification of the manufacturer's qualifications and experience in using the coating system.
- The manufacturer was required to: (a) have a minimum of 3 years of experience, and (b) verify that the coating system had been applied to a minimum of 100 manholes.
- The applicator was required to be the person responsible for the coating work, either as the field superintendent or as the person actually applying the coating.

As discussed in more detail later in this chapter, the Manhole Project was bid three different times. The first two bids sets (neither of which resulted in a contract award) included significant amounts of manhole linings and coatings. The qualification requirements included in these bid sets were the same as those described above.

6.1.4 Manhole Grouting

Manhole grouting was performed on the Brier, Lake Forest Park, Redmond, and Manhole pilot projects. Qualification requirements included for the projects were as follows:

- The contractor was required to provide certification of the manufacturer's qualifications for handling, mixing, and applying the grout system.
- The grout applicator was required to have a minimum of 3 years of grouting experience on a minimum of 50 manholes for the purpose of eliminating infiltration from the structure.
- The applicator was required to be the person responsible for the grouting work, either as the field superintendent or as the person actually performing the grouting work.

6.1.5 Pipe Bursting

Pipe bursting qualification requirements for sewer mains, laterals, and side sewers were included on the Auburn, Kirkland, Redmond, Ronald, and Skyway pilot projects. The requirements focused on the qualifications of the bursting contractor and field personnel. Qualification requirements for the Auburn, Kirkland, and Redmond pilot projects were as follows:

- The contractor was required: (a) to have at least 3 years of pipe-bursting experience, and (b) to have performed at least six pipe-bursting jobs totaling a cumulative 10,000 feet or more.
- The field superintendent was required: (a) to have a minimum of 2 years of pipe bursting experience, and (b) to have supervised a minimum of four pipe bursting projects totaling a cumulative 6,000 feet or more.
- Personnel operating high density polyethylene (HDPE) pipe fusion equipment were required to be trained and certified by the manufacturer and have a minimum of 2 years of experience in fusion welding HDPE pipelines.

Similar qualifications were required for the Skyway and Ronald projects, both of which were managed by the local agency.

6.1.6 Qualifications Review

Qualification reviews were performed on each of the 10 pilot projects prior to contract award. In addition to verifying the requirements described above, the experience of general contractors and key subcontractors and personnel was confirmed by checking references on similar projects. In all cases, the low bidder provided evidence of experience sufficient for contract award.

The qualification review period also provided the County sufficient time prior to contract award to review and assess the likelihood of completing the pilot projects on schedule. Of concern was the fact that two general contractors provided the low bids on 7 of the 10 pilot projects. These contractors demonstrated an ability to complete the projects on schedule and were subsequently awarded the contracts.

6.2 Bidding Schedule

The tight schedule required to meet the I/I program requirements presented a challenge for bidding, awarding, and constructing the pilot projects. It was necessary to substantially complete projects in time to collect post-construction flow monitoring data during the 2003-2004 wet season.

It would have been preferable to stagger bidding of the 10 projects over an extended period of time, beginning in the early months of the year. This would allow exposure of the projects to a wide variety of contractors well in advance of the busy summer construction season. Because designs for most of the pilot projects were not completed before April 2003, it was necessary to bid and award 8 of the 10 projects over a tight 2-month period.

The Skyway project had a scheduling advantage because design work was started by the local agencies before the final pilot projects were selected. For the Ronald project, SSES work, including mainline CCTV and smoke testing, was completed prior to the final pilot project selection. The design for each was completed early in the year, permitting some relief in the time

allowed for bidding and for awarding the contracts. Both contracts were advertised in mid-February and were awarded in mid-March, allowing ample time to complete construction.

Design of the eight other contracts was not completed until several months later. Advertisement of these projects was staggered over a 6-week period beginning in late April and ending in June. Table 6-1 shows the schedule for bidding activities on each of the 10 pilot projects.

In order to allow post-construction flow monitoring to begin in November 2003, contracts for the County-administered projects could allow only 90 to 120 calendar days for substantial completion of I/I improvements. Construction activities such as final paving and surface restoration could be completed at a later date as long as the sewer rehabilitation work was complete and the I/I removal effectiveness could be measured.

The bidding and construction schedule for the Manhole Project extended furthest into the year because of problems encountered during contract bidding. The project was significantly revised and was advertised a total of three times due to the lack of competitive bids. Issues encountered during bidding of the Manhole Project are discussed in Section 6.5.

Table 6-1. Bidding Schedule (Year 2003)

Project	First Ad Date	Second Ad Date	Pre-bid Meeting	Bid Open	Complete Qualification Review	Notice to Proceed	Required Substantial Completion Date by Contract
Ronald	18 Feb	25 Feb	N/A	6 Mar	10 Mar	7 Apr	1 Sep
Skyway	18 Feb	25 Feb	26 Feb	12 Mar	18 Mar	16 Apr	1 Nov
Lake Forest Park	29 Apr	6 May	7 May	20 May	4 June	22 July	19 Nov
Brier	13 May	20 May	21 May	27 May	12 June	31 July	28 Nov
Kent	13 May	20 May	21 May	29 May	16 June	4 Aug	17 Nov
Kirkland	15 May	22 May	27 May	5 June	16 June	4 Aug	22 Nov
Redmond	15 May	22 May	27 May	5 June	16 June	4 Aug	22 Nov
Mercer Island	20 May	27 May	29 May	10 June	20 June	30 July	12 Nov
Auburn	27 May	3 June	4 June	10 June	20 June	4 Aug	17 Nov
Manhole Project ¹	8 July	15 July	16 July	22 July	7 Aug	5 Sep	4 Dec

¹Dates shown are for the awarded Manhole Project.

6.3 Bidding Competition

The pilot projects generated considerable interest during bidding. Table 6-2 shows the number of plan holders and bids received for each of the pilot projects. Had more time been available for advertising, it is possible that submitting articles to national publications that focus on sewer rehabilitation work would have generated additional interest. However, the number of plan holders suggests that a suitable pool of contractors were aware of the projects.

All 10 pilot projects were advertised in the *Seattle Daily Journal of Commerce*. The eight County-administered contracts were also advertised in the *Seattle Times* and in a local minority paper. As shown in Table 6-2, a number of plan holders were from outside Washington and Oregon. Most of these contractors learned of the projects through conversations with the design team and through contact with product manufacturers familiar with the work.

In general, bidding competition was minor for the pilot projects, as shown by the number of bidders (one to four on all projects). This was likely due to: (a) the specialized nature of the work and the limited number of contractors able to meet the qualifications; (b) the overall bidding climate due to contractor workload at the time; and (c) the fact that the cost range of most projects was beyond the bidding capacity of smaller contractors, while too small for non-local larger contractors. Two general contractors completed 8 of the 10 pilot projects.

Table 6-2. Pilot Project Plan Holders

Pilot Project	Number of Plan Holders	Number of Prime Contractors	Number of Contractors Outside WA, OR	Number of Prime Contractors Outside WA, OR	Eventual Number of Bids Received
Auburn	6	6	0	0	2
Brier	16	11	6	3	2
Kent	12	10	3	2	1
Kirkland	10	8	1	1	4
Lake Forest Park	19	10	9	4	3
Manhole Project ¹	10	9	0	0	3
Mercer Island	14	8	7	4	4
Redmond	13	7	6	3	1
Ronald	16	9	3	1	4
Skyway	30	15	3	3	3

¹Quantities shown are for the awarded Manhole Project.

6.4 Bidding Issues and Addendums

The pre-bid conferences held during project advertisement allowed contractors an opportunity to voice concerns and make recommendations regarding changes to the design. The pre-bid conferences were well attended by the contractors who later submitted bids for the projects.

Issues raised at the Skyway pre-bid conference resulted in several significant changes to the design. Most of the contractors confirmed that pipe bursting of laterals and side sewers is an effective rehabilitation method. However, the additional costs associated with excavating a pit at the right-of-way to install a new cleanout should be considered. Also, the lateral pipe size diameter at this location changed from 6 inches to 4 inches as the pipe extended onto private property. It was noted that significant cost increases would result; the contractor would need to dig a pit for the cleanout and start and stop the pipe burst pull at this intermediate pit. While a cleanout at the right-of-way was required per district standards, the district and the County authorized a change given: (a) the significant cost savings, and (b) assurances by contractors that pipe bursting could be done continuously from the house to the sewer main. The pipe size changed from a 6-inch diameter in the public right-of-way to a 4-inch diameter from the house to the main. This more readily allowed for pipe bursting around bends on private property.

Another change requested by most contractors was elimination of many of the testing requirements, including mandrel testing and air testing of the new sewer mains, laterals, and side sewers. While some testing requirements were modified (for example, mandrel testing for side sewers was revised to a ball test), most were left as project requirements. Additional discussion of field testing performed during the pilot projects is included in Chapter 7.

Another significant issue raised during advertisement of the Skyway project was whether the native soils at the pit excavations could be stockpiled and re-used, or, whether the soil should be immediately hauled offsite and replaced with an imported material. The bid documents originally included a provision for the latter to ensure cleanliness of project sites and private properties. Some contractors were concerned that hauling, disposing of, and replacing the native materials represented an unnecessary expense if the material met the soil property requirements for re-use. In order to allow the contractor flexibility, excavation stockpiling and re-use were allowed, with requirements added for protection and restoration of private property and the right-of-way. The contractor subsequently awarded this contract used all imported material on the job in order to avoid stockpiling on private properties and on narrow residential streets. Other minor changes were made to the Skyway bid documents as a result of the pre-bid conference. The revisions were incorporated into specifications for other pipe bursting pilot projects that followed the Skyway project.

Regarding the remaining pilot projects, contractors raised a limited number of issues. Several questions resulted in minor changes. Issues regarding warranty language and the length of the warranty were raised during advertisement of the initial CIPP pilot projects; these resulted in changes by addenda. There were also issues raised about various submittals and testing requirements. For the most part, these sections remained unchanged in the final contract documents.

6.5 Subcontracting Issues

The most significant issue encountered during advertisement and bidding of the pilot projects was teaming a general contractor with specialty subcontractors. This was an issue particularly when there were similar or competing technologies between the two firms involved. The most apparent example was encountered during bidding of the Manhole Project.

As mentioned previously, the Manhole Project needed to be advertised three times. The design of the project and the organization of the work changed significantly during the process. Initially, the contract documents combined the work in the three pilot basins and included a significant amount of manhole rehabilitation using cementitious, polyurethane, and epoxy liners and chemical grouts. A pre-bid conference for the contract was well attended by the subcontractors who performed each element of the specified work. However, concern was raised that there were no contractors that seemed willing or able to serve as general contractors for the work. Ultimately, there were no bids received for the first contract. Feedback from several of the lining subcontractors after the bid opening indicated that some of the competing lining manufacturers were not willing to work collectively on a combined rehabilitation project. Other factors such as the limited amount of work involving a particular subcontractor, strict warranty requirements, time of year, and current workload for subcontractors may also have contributed to the lack of bids.

After receiving no bids, the County decided to separate the work in the three pilot basins, and prepared standalone contract documents for the manhole rehabilitation work in Coal Creek, Northshore, and Val Vue. The scope of the rehabilitation work remained similar to the work included in the first contract; however, the manhole lining types were segregated by district in hopes of alleviating any conflicts between competing manufacturers and installers. Changes to the warranty requirements were also made to address concerns raised during the first contract advertisement. After advertising the separate contracts, a total of seven bids were received, all of which were well in excess of the engineer's estimate. At the County's discretion none of the separated contracts were awarded.

All of the manhole linings were subsequently deleted from the contract after the second advertisement, in favor of a manhole rehabilitation contract using only chemical grout. The work in the three basins was again packaged into one contract since there would be no competing technologies, it was re-bid, and the contract was awarded.

Subcontracting issues were also encountered on several of the CIPP lining projects when some of the contractors that would be performing the sewer main lining were unenthusiastic about teaming with the subcontractors that would be performing lateral rehabilitation work. Although the issue did not preclude the County from awarding any of the CIPP contracts, it may have resulted in a reduced number of bidders.

6.6 Bid Costs

Bid tabulations for each of the pilot projects are included in Appendix C. Table 6-3 shows a summary of the engineer's estimates and the range of bids received for each project.

Five of the ten pilot projects had low bids within 7 percent of the engineer's estimate. The other five projects had low bids with a 15 percent or greater difference from the engineer's estimate. Also, the high bids were a minimum of 20 percent greater than the low bids on all pilot projects where there was more than one bidder. It was difficult to ascertain whether the spread in bids was due to uncertainty concerning project conditions, low bidders underbidding actual costs to obtain work, high bidders overbidding actual costs due to work complexity or current workload, or some other factors. An analysis was conducted by the contracting agencies prior to award. With the exception of the second Manhole Project contract documents, all low bids met the requirements.

Several irregularities were noted among the contracts for similar unit price bid items. The low bid for pipe bursting of 8-inch-diameter sewer mains for the Kirkland pilot project was \$95 per linear foot compared to \$75 per foot for Auburn and \$38 per foot for Skyway, where similar work was included in each bid item. The \$38 per foot Skyway bid was significantly below the engineer's estimate for this item. The lower-than-expected cost was mainly attributed to a favorable bidding climate at the time of the project advertisement in mid-February. The cost difference between the Kirkland and Auburn projects for bursting mains was likely due to some imbalance between bid items on the Kirkland project.

Table 6-3. Pilot Project Bid Totals

Pilot Project	No. of Bidders	Engineer's Estimated Construction Cost¹	High Bidder Price¹	Low Bidder Price¹
Auburn	2	\$321,000	\$410,598	\$324,675
Brier	2	\$393,000	\$512,016	\$425,359
Kent	1	\$755,000	\$1,099,544	\$1,099,544
Kirkland	4	\$825,000	\$1,115,974	\$781,775
Lake Forest Park	3	\$757,000	\$975,770	\$801,893
Manhole Project ²	3	\$597,000	\$1,112,500	\$220,990
Mercer Island	4	\$867,000	\$870,824	\$736,654
Redmond	1	\$881,000	\$899,117	\$899,117
Ronald	4	\$1,471,000	\$2,296,151	\$1,154,660
Skyway	3	\$1,864,000	\$2,046,745	\$1,283,250

¹ All prices exclude sales tax. Sales tax rate was 8.8 percent for all projects except Brier, which was 8.9 percent.

² Prices shown are for the awarded Manhole Project contract.

The unit bid prices received on the CIPP projects allowed direct comparison of various liner material types used on the projects. The unit price for 8-inch-diameter sewer main rehabilitation was \$55, \$45, \$38, and \$23 per linear foot for the low bidders on Redmond, Lake Forest Park, Brier, and Mercer Island projects, respectively. The higher unit costs for Redmond and Lake Forest Park could be attributed to the use of a fiberglass liner material with epoxy resin, which has a higher material cost and takes longer to install. The low unit cost for Mercer Island could be attributed to allowing greater flexibility in the contractor's choice of liner and resin materials, which resulted in less expensive materials being used and in generating increased competition between bidders. Some of the materials used on the CIPP projects had improved performance or rehabilitation capability over the others; thus, this also needed to be weighed into the cost comparison.

Table 6-4 shows the unit prices received from the low bidders for the sole source items specified in the contracts. The bid prices for these items were mostly higher than the engineer's estimates. The higher bid prices were generally attributed to the fact that the products were bid as sole source. With a very limited number of subcontractors licensed to install the products, competition was not promoted. Additionally, cost estimates for these items were typically derived with significant input from the product manufacturers. Manufacturers tended to underestimate the final installed costs.

Table 6-4. Unit Prices for Sole Source Bid Items

Pilot Project	Product	Engineer's Estimate	Low Bid Price
Brier	Lateral Connection		
	Liner	\$165 per linear foot	\$255 per linear foot
	Poly-Triplex® PTLS-4400	\$385 per vertical foot	\$445 per vertical foot
Kent	T-Liner®	\$75 per linear foot	\$118 per linear foot
Redmond	MultiLiner®	\$55 per linear foot	\$45 per linear foot
	TOP HAT™	\$1,600 each	\$2,800 each
	T-Liner®	\$220 per linear foot	\$312 per linear foot

The unit price difference in T-Liner® between the Kent and Redmond projects resulted from a difference in installed length, rather than from material or manufacturing costs. There is a relatively minor material cost difference between manufacturing a 20-foot-long T-Liner® versus a longer liner of say, 80 feet. Also, much of the cost of T-Liner® installation is derived in positioning the liner for the inversion process up the lateral. Thus, installation costs on a per-foot basis are much higher for shorter installation lengths, as was the case for the Redmond project.

As noted above, the Manhole Project was advertised and bid a total of three times. The first advertisement received no bids. In order to avoid placing competing general contractors and subcontractors under the same contract, the pilot basins were split into three separate contracts

for the second advertisement. Table 6-5 summarizes the bid prices for the second advertisement, where the three low bids received totaled \$840,600. A cost analysis was conducted on the bids from the second advertisement. It was concluded that the bids were too high for the amount of work to be completed. The high bids were attributed to large general contractor markups on the lining work and a lack of bidders on the projects.

Table 6-5. Bid Totals for Second Advertisement of Manhole Project

Pilot Basin	No. of Bidders	Engineer's Estimated Construction Cost¹	High Bidder Price¹	Low Bidder Price¹
Coal Creek	2	\$210,140	\$499,800	\$288,870
Northshore	2	\$338,835	\$730,300	\$445,430
Val Vue	3	\$71,055	\$273,200	\$106,300
Total of Low Bids				\$840,600

¹ All prices exclude sales tax

For the third advertisement, the rehabilitation work was changed to use chemical grout in place of the manhole liners, and the pilot basins were combined back into one set of contract documents. The resulting low bid was \$220,990. This bid price was for rehabilitating approximately the same number of manholes specified in the second advertisement of the project. The bid price for the second advertisement totaled \$840,600. While there were likely some savings in contractor administration costs in changing from three contracts to one, the cost difference of \$619,610 can mostly be attributed to a switch in technologies used. Although the liners were not used, the second advertisement results provide some useful data for comparing the cost of these technologies to chemical grout.